

42. (thrice amended) A method for making an array of diverse materials, the method comprising

forming ten or more inorganic materials on ten or more predefined discrete regions of a rigid substrate, respectively, each of at least ten of the materials being different from each other and being formed by a method that comprises

delivering a first component of the material to the respective predefined discrete region of the substrate to form a first solid layer of the first component on the substrate,

delivering a second component of the material to the respective predefined discrete region to form a second solid layer of the second component on the first layer, and

varying the composition, concentration, stoichiometry or thickness of the delivered first or second components between respective regions,

the substrate comprising a sufficient amount of space between the ten or more regions such that the delivered components do not substantially interdiffuse between the ten or more regions of the substrate.

68. (thrice amended) A method for making an array of diverse materials, the method comprising

forming ten or more inorganic materials on ten or more predefined discrete regions of a rigid substrate, respectively, each of at least ten of the materials being different from each other and being formed by a method that comprises

delivering a first component of the material to the respective predefined discrete region of the substrate to form a first solid layer of the first component on the substrate,

delivering a second component of the material to the respective predefined discrete region to form a second solid layer of the second component on the first layer, and

varying the composition, concentration, stoichiometry or thickness of the delivered first or second components between respective regions.

70. (thrice amended) A method for making an array of diverse materials, the method comprising

forming ten or more inorganic materials on ten or more predefined discrete regions of a substrate, respectively, each of at least ten of the materials being different from each other, and being formed by a method that comprises

sequentially delivering five or more components of the material to the respective predefined discrete region of the substrate to form five or more solid layers of the delivered components, each of at least five of the delivered components being an inorganic element or compound, and

varying the composition, concentration, stoichiometry or thickness of at least one of the five or more delivered components between respective regions.

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72. (thrice amended) A method for identifying useful materials, the method comprising forming one hundred or more solid inorganic materials on one hundred or more predefined discrete regions of a rigid substrate, respectively, each of at least one hundred of the materials being different from each other and being formed by a method that comprises

delivering a first component of the material to the respective predefined discrete region of the substrate to form a first solid layer of the first component on the substrate,

delivering a second component of the material to the respective predefined discrete region to form a second solid layer of the second component on the first layer,

varying the composition, concentration, stoichiometry or thickness of the delivered first or second components between respective regions, and

allowing the delivered first and second components of the material to simultaneously interact under a set of conditions,

the substrate comprising the at least one hundred material-containing regions at a density of greater than about 10 regions per  $\text{cm}^2$ , the substrate further comprising a sufficient amount of space between the at least one hundred material-containing regions such that the delivered components do not substantially interdiffuse between the at least one hundred material-containing regions of the substrate,

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screening the at least ten different materials for one or more useful properties of interest,  
and  
determining the relative performance of the at least ten different materials with respect  
to the property of interest.

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74. (twice amended) A method for identifying useful materials, the method comprising  
forming ten or more inorganic or non-biological polymeric materials on ten or more  
predefined discrete regions of a substrate, respectively, each of at least ten of the materials  
being composite materials that are different from each other and being formed by a method  
that comprises

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delivering a first component of the composite material to the respective  
predefined discrete region of the substrate to form a first solid layer of the first component on  
the substrate,

delivering a second component of the composite material to the respective  
predefined discrete region to form a second solid layer of the second component on the first  
layer, and

varying the composition, concentration, stoichiometry or thickness of the  
delivered first or second components between respective regions,

screening the at least ten different composite materials for one or more useful properties  
of interest, and

determining the relative performance of the at least ten different composite materials  
with respect to the property of interest.

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81. (new) The method of claims 68 or 69 wherein the array comprises at least 10,000  
different materials comprising two or more layers.

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82. (new) The method of claims 68 or 69 wherein one thousand or more different  
materials comprising two or more layers are formed on one thousand or more discrete regions

of the substrate, the density of the one thousand or more material-containing regions being greater than about 10 regions per cm<sup>2</sup>.

83. (new) The method of claim 68 or 69 wherein the ten or more different materials comprise layers of two or more components, at least one of the components being different between the ten or more materials, and at least one of the components being the same between the ten or more materials.

84. (new) A method for making an array of diverse materials, the method comprising forming ten or more inorganic materials on ten or more predefined discrete regions of a rigid substrate, respectively, each of at least ten of the materials being different from each other and being formed by a method that comprises

delivering a first component of the material to the respective predefined discrete region of the substrate to form a first solid layer of the first component on the substrate,

delivering a second component of the material to the respective predefined discrete region to form a second solid layer of the second component on the first layer, and

varying the composition, concentration, stoichiometry or thickness of the delivered first or second components as a gradient between respective regions.

85. (new) A method for identifying useful materials, the method comprising making an array comprising ten or more different materials as set forth in claim 84, screening the at least ten different materials for a useful property of interest, and determining the relative performance of the at least ten different materials with respect to the property of interest.

86. (new) The method of claims 84 or 85 wherein the method for forming each of at least ten of the materials further comprises delivering a third component of the material to the respective predefined discrete region to form a third solid layer of the third component on the second layer.

87. (new) The method of claim 86 wherein each the at least ten different materials consist of a first, second and third component selected from a group of four components.

88. (new) A method for making an array of diverse materials, the method comprising forming ten or more inorganic materials on ten or more predefined discrete regions of a rigid substrate, respectively, each of at least ten of the materials being different from each other and being formed by a method that comprises

(a) delivering a first component of the material to the respective predefined discrete region of the substrate to form a first solid layer of the first component on the substrate,

(b) delivering a second component of the material to the respective predefined discrete region to form a second solid layer of the second component on the first layer,

(c) varying the composition, concentration, stoichiometry or thickness of the delivered first or second components between respective regions, and

(d) repeating steps (a), (b) and (c) at least once to form a lattice or superlattice comprising the first and second components.

89. (new) A method for identifying useful materials, the method comprising making an array comprising ten or more different materials as set forth in claim 88, screening the at least ten different materials for a useful property of interest, and determining the relative performance of the at least ten different materials with respect to the property of interest.

90. (new) The method of claims 88 or 89 wherein the method for forming each of at least ten of the materials further comprises delivering a third component of the material to the respective predefined discrete region to form a third solid layer of the third component on the second layer, such that the lattice or superlattice comprises layers of the first, second and third components.